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Military hospital food service costs are computed based upon the hospital ration concept. A "hospital ration" is subsistence furnished by the hospital food service to an individual during a 24-hour period. It is strictly a military concept which complicates the process of military-civilian comparisons. Its importance increases as hospital food services performed in-house are evaluated for possible contracting out to commercial services. This study attempts to determine the optimal method of collecting and utilizing Army hospital meal accounting data in a way comparable to civilian industry standards. A method of calculating meal equivalents provides the basis for a tangible system for military-civilian hospital food service cost comparisons, in terms acknowledged and understood by the civilian industry. Keywords ✓

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THE OPTIMAL FEASIBLE METHOD OF COLLECTING AND UTILIZING ARMY HOSPITAL MEAL ACCOUNTING DATA

A Graduate Research Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

of

Master of Health Administration

by

Captain Roxanne E. Romack, AMSC

August 1982

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INTRODUCTION

Development of the Problem

Fixed medical treatment facilities of the Active Army have implemented the Uniform Chart of Accounts which generates data that is utilized for studies on the cost of patient care and to determine the relative economy of operation-

(1) Among Army medical treatment facilities (MTFs).

(2) Between Army facilities and other Federal facilities.

(3) Between Army facilities and civilian facilities.[1]

Most of the necessary cost data is provided through the prescribed accounting system (AR 37-108), but a few special analyses are also needed. These analyses generally are results of sample studies and formulas for prorations.

Hospital food service costs are an area where prorations are done. Hospital food service costs are computed based upon the hospital ration concept. The "hospital ration" is subsistence furnished by the hospital food service to an individual during a 24-hour period (0001 to 2400 hours).[2] The term "hospital ration" is strictly a military concept which complicates the process of military-civilian comparisons.

Hospital food services are being subject to Commercial Activities requirements of potentially contracting out for services as dictated by the Office of Management and Budget

Circular A-76. This suggests that hospital food service managers will need to be able to compare the meal accounting data against industry standards. It thus becomes imperative to examine the present system of ration accounting utilized in Army hospital food services.

Statement of the problem.

The problem is to determine the optimal method of collecting and utilizing Army hospital meal accounting data that meets Uniform Chart of Accounts needs and is comparable to civilian industry standards.

Objectives, criteria, assumptions, and limitations.

Objectives.--To analyze the current Army hospital ration accounting system.

--To discuss and analyze several civilian hospital meal accounting systems.

--To evaluate the advantages and disadvantages of the present system as well as the civilian hospital meal accounting systems, based on established criteria.

--Based on the results of the civilian hospital survey and literature review a meal equivalent formula will be devised and applied to the data collected within the Tripler Army Medical Center Food Service Division.

Criteria.--The optimal feasible method must:

-Provide accurate and timely meal equivalent information.

-Provide a realistic system for comparison of military and civilian hospital food service costs per meal.

-Be compatible with the ration accounting system.

-Minimize the increase in personnel costs related to collection and computation time.

Assumptions.--The Army hospital food service use of rations to generate funds for subsistence will remain viable due to the existence of the ration law, Executive Order 11339, 28 March 1967 and the implementing DOD Directive 1338.10, 12 June 1979 for establishing the Daily Food Allowance for the Army.

Limitations.--Observations of the current Army hospital ration accounting system will be limited to Tripler Army Medical Center Food Service Division.

--Data collected from civilian hospitals will be limited to hospitals with capacities of 500-599 beds and regionalized in the western states of Hawaii, Alaska, Washington, Oregon, California, Idaho, Nevada, and Arizona, and the midwestern states of Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming.

Review of the Literature

In feeding patients, the common goal of hospitals and other health care related facilities is to provide quality food that is nutritionally adequate at the least possible cost. The mission of the Army hospital food service is to provide comprehensive nutritional care to include safe, wholesome foods. Special diets are served as appropriate. Food costs must stay within the established monetary subsistence allowance.

The food cost information system should provide current and useful data. Therefore the data-keeping system for food costs must be sound.[3,4] This information must be timely and pertinant if management is going to be able to analyze the information for effective decision-making.

Montag suggests that food costs should be compared with some goal, such as a desired food cost per meal or industry standard.[5] Berkman feels this approach is unfortunate as the definition of a meal equivalent varies resulting in opportunities for cost manipulations. A comparison of a department's current data with previous data using the same definition of a meal may result in more accurate information.[6]

Hospitals participating in the Hospital Administrative Services (HAS) of the American Hospital Association input data which is used to generate departmental indicators. This HAS report is to be used only as a tool in cost control. It does not prove good or bad performance, but suggests the need to examine deviations from the norm for further analysis.[7] The data must be reported using uniform accounting definitions if the data is to be comparable. The HAS indicators are calculated on a per meal basis, i.e., total meals per patient day, direct cost per meal, labor cost per meal, meals served per manhour, in-patient meals served per patient day, cafeteria meals (% of total meals)

and cafeteria meals per manhour.[8] Although the HAS report is a confidential monthly report, annual trend data is published. This data is accessible for all hospitals for comparison purposes.

The Washington State Hospital Association (WSHA) established an independent hospital commission to regulate hospital costs in 1972.[9] The WSHA attempted to find an equitable method of comparing costs but felt the HAS approach of classifying hospitals according to bed size and teaching activity was inappropriate for WSHA's needs. WSHA identified 12 hospital and 6 community variables that have significant effect on hospital costs:

Hospital Variables

-number of available hospital beds
-investor-owned or not -for-profit
-government or nongovernment
-accredited or nonaccredited
-hospital's position in terms of the New York service index
-number of physician specialities
-number of interns
-number of intern specialities
-number of residents
-number of resident specialities
-Medicare days per total inpatient days
-Medicaid days per total inpatient days

Community Variables

-number of physicians per 1000 population
-number of beds per 1000 population
-percentage of population 65 years of age and over
-percentage of population female between 15 and 44 years of age
-percentage urban
-median income of the total statisical population

From this data, all hospitals in Washington are grouped

into one of five peer classifications for cost comparisons. These cost comparisons are based on standard definitions of patient meal and non-patient meal equivalents. Food service comparisons will only be made for operational proficiency.[10] Operations with major variances can use the data to initiate further investigations and corrections as appropriate.

McLaren echoes the previous views that performance comparisons should only be performed when standard methods of calculating productivity are used such as the method recommended by the American Hospital Association and the American Society for Hospital Food Service Administrators.[11]

The purpose of this study then is to determine a standardized method of collecting and utilizing meal accounting information for purposes of comparison with industry standards.

Research Methodology

--Initial data will be collected from civilian hospitals to include methods of colkecting meal counts, breakdown of patient, non-patient categories, use of meal equivalents, and methods of accounting for nourishments and supplements. The survey instrument is attached at Appendix A.

--An analysis of raw data currently collected for the Army hospital ration accounting system and appropriateness to conversion to meal equivalents will be accomplished.

--A one year collection of actual total meals, non-

patient and patient before ration conversion will be accomplished at Tripler Army Medical Center Food Service Division.

--A one month collection of daily nourishments served will be accomplished.

--The computed meal equivalent will be analyzed against Tripler Army Medical Center Food Service Division direct costs for the last fiscal year and then compared to the data collected from the surveyed civilian hospitals.

--The time spent collecting and computing the data at Tripler Army Medical Center Food Service Division will be documented and analyzed as the impact on the organization.

DISCUSSION

Analysis of the Current Army Hospital Ration Accounting System.

Accurate records of daily meals served and rations served daily, monthly and annually, are maintained in every Army hospital food service facility. This data is the basis for determining future requirements for food supplies, as well as providing data for costing, staffing and reporting purposes.

Three forms, DA Form 1833-2 (Hospital Food Service-Ration Source Data Worksheet), DA Form 1833-1 (Hospital Food Service - Meals Served Record), and DA Form 1833 (Hospital Food Service - Ration Record) are of interest. Both the DA Form 1833-2 and the DA Form 1833-1 support the DA Form 1833. The DA Form 1833-2 provides a daily record of ward meals served, and dining hall meals served to both patients and non-patients. Each person entering the dining hall is charged a set price and may eat any portion of a meal from a single salad to a whole meal. This is always counted in the same manner, as a complete meal. Figures for ward meals served are provided by Clinical Dietetics personnel. Figures for dining hall meals served are provided by the dining hall headcount.

The DA Form 1833-1 provides a monthly summary of daily meals served in the dining hall or on the wards. Differentiation of non-patient and patient categories served in the

dining hall is not made. Nor are monthly totals accomplished for meals served. The DA Form 1833 provides the means to convert the daily meals served data to rations. Each meal served is weighted as follows:

Meal	Factor
Breakfast	.20
Lunch	.40
Brunch	.45
Dinner	.40
Dinner/Brunch	.55
Night meal	.20 or .40 depending on whether breakfast or dinner meal is served.

The actual patient meal served data is not used to compute the patient ration, the "beds occupied" status less bassinets is utilized.

As can be seen, the Army ration accounting system does not provide a method for consolidating actual patient meal accounting data, although the raw data is available. Actual non-patient meals served accounting data is utilized in non-patient ration accounting.

Analysis of the Surveyed Civilian Hospital Meal Accounting Systems.

A survey of meal accounting systems in selected hospitals in the west and midwest was conducted in two mailings. Hospitals were selected based on operating beds of 500 - 599 as reported in the American Hospital Association Guide.

In the western states, thirteen surveys were mailed with seven responses of which only five were useable do to lack of statistical information. All hospitals that responded were general medical and surgical hospitals. In the midwestern states, fifteen surveys were mailed with seven responses of which six were useable. Four hospitals were general medical and surgical hospitals, one hospital was a long term care facility, and one was a general medical and psychiatric hospital. A total of eleven surveys were useable for this study.

TABLE 1

OPERATING BED, ADMISSION AND CENSUS DATA FOR FISCAL YEAR 1981

	Operating Beds	Annual Admissions	Average Daily Census
	580	29,715	482
	546	21,129	459
Western States	523	19,000	381
	505	2,546	441.9
	565	19,200	433
	385	98,000	330
	588	19,396	420
Midwestern States	540	?	410
	525	20,374	381
	539	18,818	457
	600	18,500	427

Table 1, Operating Bed, Admission, and Census Data

notes the information for responding hospitals. As shown, one midwestern hospital was actually below the minimum 500 operating bed limit.

Patient meal census collection was accomplished either by actual count of trays (7 responses) or by reporting inpatient meals at 2.8 meals per patient day. Nonpatient meal census was obtained by an equivalent meal count in a pay cafeteria by dividing total sales by the average selling price of a full meal in nine hospitals. A full meal was defined as including meat, starch, vegetable, salad, beverage, and dessert. As noted earlier, Army hospital non-patient meals are based solely upon headcount, not upon categories of items sold. Two hospitals utilized actual count of customers for meal census for the non-patient category. Of the surveyed hospitals, four utilized meal equivalents for inpatients and nine hospitals utilized meal equivalents for nonpatients.

Nourishments, supplements, and between meal snacks were considered part of each day's meals in ten of the hospitals. One hospital reported using a factor of 0.5 multiplied by the patient census to account for nourishments. This factor was based upon institutional data and resulted in a patient meal census of 3.3 X Patient Census (2.8 for meals + 0.5 for nourishments and supplements or meal snacks). Therefore only one surveyed hospital converts nourishments, supplements or snacks to meal equivalents.

None of the surveyed hospitals bill patients for each meal served. Seven of the hospitals bill patients a per diem rate as part of the hospital room rate and four hospitals do not. Only two of the surveyed hospitals charge an additional amount for nourishments.

Table 2, Median Values for Dietary Department Statistics in Surveyed Hospitals for a Twelve-Month Period provides a summation of the data collected from the surveyed hospitals.

TABLE 2

MEDIAN VALUES FOR DIETARY DEPARTMENT STATISTICS IN SURVEYED HOSPITALS FOR A TWELVE-MONTH PERIOD

Statistic	West*	Midwest#	Total Civilian	TAMC
Number of hospitals	5	6	11	1
Total meals/patient day	4.44	5.01	4.78	4.06
Direct cost/meal($)	3.52	3.235	3.46	5.95
Food and Supply cost/meal ($)	1.74	1.53	1.58	1.78
Labor cost/meal	1.94	1.57	1.74	4.17
Meals served/manhour	3.37	3.34	3.37	2.83
Inpatient meals served/ patient day	2.71	2.81	2.78	2.46
Cafeteria meals(% of total meals)	39%	45%	44.5%	51%
Cafeteria Meals/ manhour	3.37	3.16	3.265	2.81
Meals/Full-Time Equivalent(FTE)	6994	6984	6994	6784
Patient Days/FTE	1403	1339	1371	1673
Labor cost/FTE manhour	6.14	5.79	6.04	11.81

*Alaska, Arizona, California, Hawaii, Idaho, Nevada, and Washington.

#Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Wyoming.

Tripler Army Medical Center (TAMC) data is also presented. It is striking to note three major things. First, the comparison of median values for western hospitals and midwestern hospitals shows that midwestern hospital meal costs as a whole are lower than western hospital meal costs. This is related to lower labor, food, and supply costs. Secondly, Tripler Army Medical Center has a significantly higher direct cost/meal ($5.95 TAMC versus $3.46 civilian). This relates to the two areas of higher labor costs for Tripler Army Medical Center and a lower productivity. Tripler Army Medical Center's labor force annually produces only 6784 meals per full time equivalent employee as opposed to a median value of 6994 meals annually in the surveyed civilian hospitals. It is worth noting that Army hospital food service employees generally are Civil Service employees earning journeymen level wages. Additionally, Army hospital food service departments rarely utilize part-time workers. This contributes to a high labor cost.

Civilian hospitals generally supplement one full-time shift with part-time workers to help economize in the area of labor costs.

The third area of mention is a lower rate of productivity.as previously mentioned. This relates to the high number of full time workers providing double shift coverage in Army hospital food service departments. It is further theorized that Army civil service workers are an older

population with higher loss time due to accumulated annual leave and sick leave usage. Additionally, because they are generally older, they work slower.

Analysis of Daily Nourishments.

Tripler Army Medical Center food service delivers nourishments three times daily, at 1000 hours, 1400 hours, and 2000 hours. Nourishments can be ordered by the physician or can be added to a patient's daily meals by the dietitian when for nutritional reasons it is essential that the patient's meals be supplemented. For a one month period all daily nourishments were recorded on a ledger. This collection took approximately 15 minutes per day. Table 3, Average Values of Patients and Items Served as Nourishments for a One Month Period summarizes the data collected:

TABLE 3

AVERAGE VALUES OF PATIENTS AND ITEMS SERVED AS NOURISHMENTS FOR A ONE MONTH PERIOD

Serving Time	Average number of patients served	Average number of item served
1000 hours	5.13	9.87
1400 hours	22.07	94.10
2000 hours	30.23	67.13

The 1400 hour nourishment feeding initially appears to have an unusually high level of items served. A closer look at this revealed that this serving time is the time that special supplemental feedings, i.e., Ensure, Vivonex

Aminade, Sustacal, and Osmolite are delivered. The Hospital Administrative Services (HAS) standard is that the cost of nourishments is to be considered a portion of the patient food cost. These costs are offset generally by patients receiving liquid diets or by patients who are not consuming food. Hospital Administrative Services does recommend that hospitals derive their own floor-stock food nourishment equivalent. This is accomplished to allocate both direct and indirect costs into patient and nonpatient areas. Since this study is only looking at direct costs, this study was not accomplished.

Since the cost of nourishments is considered part of the daily food cost, comparison of nourishments between hospitals is non-essential. But it is imperative that an individual hospital periodically analyze the amount of nourishments being served to determine changes in the trend. It is relatively simple for the manager to accomplish a count of nourishments served and compare this to previous data. If meal costs rise, the manager may wish to see if there has been an increase in nourishments served.

Analysis of Meal Equivalent Applicability in Army Hospital Food Services.

Table 4, Actual Values for TAMC Food Service Statistics for Fiscal Year 1981, lists the actual figures accumulated at Tripler Army Medical Center.

TABLE 4

ACTUAL VALUES FOR TAMC FOOD SERVICE STATISTICS FOR FISCAL YEAR 1981.

Full Time Equivalent Food Service Workers, as of 30 September 1981	95
Total Patient Days (Total Patient Rations)	155,572
Total Patient Meals Served	382,281
Total Nonpatient Meals Served	248,650
Total Direct Costs	$3,753,395
Total Food Costs	$1,018,351
Total Military Labor Costs	$ 313,010
Total Civilian Labor Costs	$2,318,186
Total Supply Costs	$ 103,848
Total Manhours	222,778

Table 5, Civilian Hospital Total Patient Days and Total Patient Meals for Fiscal Year 1981 provides the data on patient days and meals with the resulting ration of meals per patient day. The Tripler Army Medical Center ratio is well within the range of the surveyed hospitals, but is considerably lower than the Hospital Administrative Services meal equivalent of 2.8 meals per patient day. This lower rate of meals per patient day is thought to be triggered by the numbers of patients undergoing special laboratory tests, procedures, and surgery since Tripler Army Medical Center has a large teaching program for physicians.

The data accumulated at Tripler Army Medical Center

TABLE 5

CIVILIAN HOSPITAL TOTAL PATIENT DAYS AND TOTAL PATIENT MEALS FOR FISCAL YEAR 1981

Hospital	Total Patient Meals	Total Patient Days	Ratio
1	542,000	180,675	3.00
2#	535,443	162,255	3.30
3*	417,986	149,000	2.81
4*	421.487	150,531	2.80
5	398,777	166,684	2.39
6	433,031	155,693	2.78
7	476,617	176,119	2.71
8	391,039	168,351	2.32
9	396,200	142,500	2.78
10	407,705	139,244	2.93
11**	414,643	158,212	2.62
TAMC	382,281	155,572	2.46

*Hospitals utilizing HAS meal equivalent of 2.8 meals per patient day.

#Hospital utilizing HAS meal equivalent of 2.8 meals per patient day + 0.5 meals per patient day for nourishments.

**Hospital reporting the use of HAS meal equivalent of 2.8 meals per patient day.

suggests that the conversion of patient rations into meals served could be accomplished using a meal equivalent of 2.46 meals per patient ration:

Patient meals served = Patient rations X 2.46.

As noted in Table 4, the total nonpatient meals served for fiscal year 1981 was 248,650 meals. The total nonpatient rations earned for fiscal year 1981 was 92,660. This results in a meal equivalent of 2.68 annually. When

this data is spread out monthly, the resulting monthly nonpatient meal equivalent is as shown in Table 6.

TABLE 6

MONTHLY NONPATIENT MEALS AND EARNED NONPATIENT RATIONS

Month	Nonpatient Meals Served	Nonpatient Rations Earned	Ratio
1	20,345	7435	2.74
2	19,862	7205	2.76
3	21,233	7533	2.82
4	23,198	8458	2.74
5	21,755	8283	2.63
6	22,030	8018	2.75
7	21,944	8086	2.71
8	19,299	7477	2.58
9	17,280	7008	2.47
10	20,576	7600	2.71
11	18,467	7202	2.56
12	22,661	8355	2.71
Total	248,650	92660	2.68

The calculation for converting nonpatient rations to nonpatient meals is:

Nonpatient meals served = Nonpatient Rations X 2.68.

CONCLUSION

The use of the Hospital Administrative Services meal equivalent of 2.8 meals per patient day is inappropriate at Tripler Army Medical Center as shown by the patient data collected and analyzed over a twelve-month period. Actual data reveals a meal equivalent figure of 2.46 which falls wihin the range of surveyed hospitals. When applied to the patient days or patient ration data, the result provides a meaningful figure with which to compare Tripler Army Medical Center food service costs per patient meal to the civilian hospital industry. In the same manner using a meal equivalent of 2.68 per nonpatient ration converts nonpatient rations served into a valid figure for comparison purposes.

It is worth noting that these meal equivalent figures apply directly to Tripler Army Medical Center and may not be valid at other military hospitals. Further study at small and large Army hospitals, with and without teaching programs is recommended to determine both a patient and nonpatient meal equivalent figure that would provide not only military-civilian, but also military-military comparisons on a meal served basis.

The use of the meal equivalent figures provides a very

rapid calculation of converting rations served into meal equivalents. This eliminates the need to accumulate any further data or perform daily or monthly summaries of meals served for either patient or nonpatient categories.

The use of meal equivalents applied to Army hospital ration accounting data provides a ready conversion that allows the food service administrator and the hospital chief executive officer to compare data to civilian industry. With such information, managers can readily defend costs for purposes of the Uniform Chart of Accounts, contracting out under commercial activities as directed by the Office of Management and Budget, and internal productivity measurements.

The method of calculating meal equivalents for the patient and the nonpatient categories in Army hospitals meets the criteria set forth in this study's introduction. This method provides accurate and timely information since it can be applied to monthly, quarterly, or annual data. It provides a tangible system for military-civilian hospital food service cost comparisons in terms that are acknowledged and understood by the civilian industry. Further this method is compatible with the ration accounting system utilized by Army hospital food service departments as it employs the rations served data to compute the meal equivalent data. Collection time for data does not change since only data that is currently collected is utilized. Computation time is minimal as it

involves data already available (rations served) that is applied to the appropriate meal equivalent figure. This results in an insignificant increase in personnel costs related to both collection and computation time.

It is recommended that further study of this method as applied to a variety of Army hospitals be made to strengthen its validity for large-scale comparisons.

FOOTNOTES

[1]Headquarters, Department of the Army, Medical Services Expense and Performance Reporting Systems, AR 40-331, (Washington, D.C.: 1 April 1980), p. 1-1.

[2]Headquarters, Department ofthe Army, Medical Services Army Medical Treatment Facilities General Administration, AR 40-2, Change 1, (Washington, D.C.: 15 August 1981), p. 9-1.

[3]Geraldine M. Montag, "Obtaining Meaningful Cost Information in Dietary Departments," Journal of the American Dietetic Association, July 1975, p. 50.

[4]Web D. Evans, "Accounting Should Show Valid Costs," Hospitals, March 1, 1974, p. 106.

[5]Montag, p. 50.

[6]Jerome Berkman, "Food Service Needs Controls to Contain Costs," Hospitals, March 16, 1980, p. 79.

[7]"Aid to Cost Control: HAS Departmental Indicators," Journal of the American Dietetic Association, February 1973, p. 171.

[8]Ibid., p. 172.

[9]P. Craig Weisman and Don W. Tarbutton, "Hospitals Work With Commission to Ensure Equitable Costs," Hospitals, November 16, 1977, p. 81.

[10]Ibid., p. 83.

[11]Alan McLaren, "Containing the Costs of Food Service," Hospitals, March 16, 1980, p. 76.

APPENDIX A

MEAL ACCOUNTING INFORMATION SURVEY

1. What is your hospital type?

   General medical and surgical_____
   Children's general_____
   Psychiatric_____
   Long term care_____
   Other:_____

2. What is the number of operating beds?_____

3. What was your annual admissions for fiscal year 1981?_____

4. What was your average daily census for 1981?_____

5. Briefly explain your hospital's method of collecting patient and nonpatient meal census. Please attach sample forms.

6. Does your hospital utilize meal equivalents? ____yes_____no
   Define the term meal equivalent as your hospital uses it.

7. Describe how nourishments, supplements, and between meal snacks for patients are accounted for.

8. Are patients billed for each individual meal?_____yes_____no

9. Are nourishments, supplements, and between meal snacks converted to meal equivalents based on a factor-method? _____yes_____no. If yes, please attach a copy of the factor method used.

10. Are patients billed a per diem rate as part of the hospital room rate?_____yes_____no.

11. Are patients receiving nourishments, supplements, and between meal snacks billed for each item based on a pre-established rate schedule?_____yes_____no. Or are these items included in the hospital room charge _____yes _____no. Please attach a copy of the rate schedule. Describe other methods used.

12. What is the number of Full-Time Equivalent food service workers (to include professional staff)?_____

13. For fiscal year 1981, what was your hospital's:

    a. total patient days?_____
    b. total inpatient meals?_____
    c. total cafeteria meals?_____
    d. total direct costs?_____
    e. total labor costs?_____
    f. total supply costs?_____
    g. total number of manhours?_____

THANK YOU !

APPENDIX B

DEFINITIONS

Meal-- A specific quantity of food provided one person during one scheduled serving period.

Nourishment--Supplemental between meal feedings as prescribed by diet order and/or medical condition.

Ration--The subsistence furnished to an individual during a 24-hour period (0001 to 2400 hours).

Uniform Chart of Accounts--A federal uniform reporting methodology that provides consistent financial and performance data to assist in the management of health care.

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